

# Bulletin

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## EDUCATION ATTRACTS FEWER ACADEMICALLY HIGH ACHIEVING YOUNG WOMEN

The number and academic standing of high school seniors planning to major in education were lower in 1980 than in 1972. Academic records of those women who planned to major in education were lower compared both to their 1980 classmates who planned to major in other fields, and to their 1972 counterparts.

These findings are based on an analysis of data collected in the 1980 High School and Beyond (HS&B) study and in the National Longitudinal Study of the High School Class of 1972 (NLS-72). Both HS&B and NLS-72 are national longitudinal studies sponsored by the National Center for Education Statistics (NCES). In these studies, high school seniors (24,000 in NLS-72 and 28,000 in HS&B) took cognitive tests and completed a questionnaire about their backgrounds, high school experiences, and plans. Students who planned to go to college were also asked about their intended field of study. This analysis involved two groups from the 1972 and 1980 college aspirants: those expecting to major in education and those expecting to enter some other fields.<sup>1</sup>

Specific results of the analysis are summarized below. In interpreting these findings, it should be kept in mind that some students who planned to teach or to obtain teaching certification might major in some fields other than education. For example, students who planned to teach mathematics or foreign languages in secondary schools might major in these fields rather than in education.

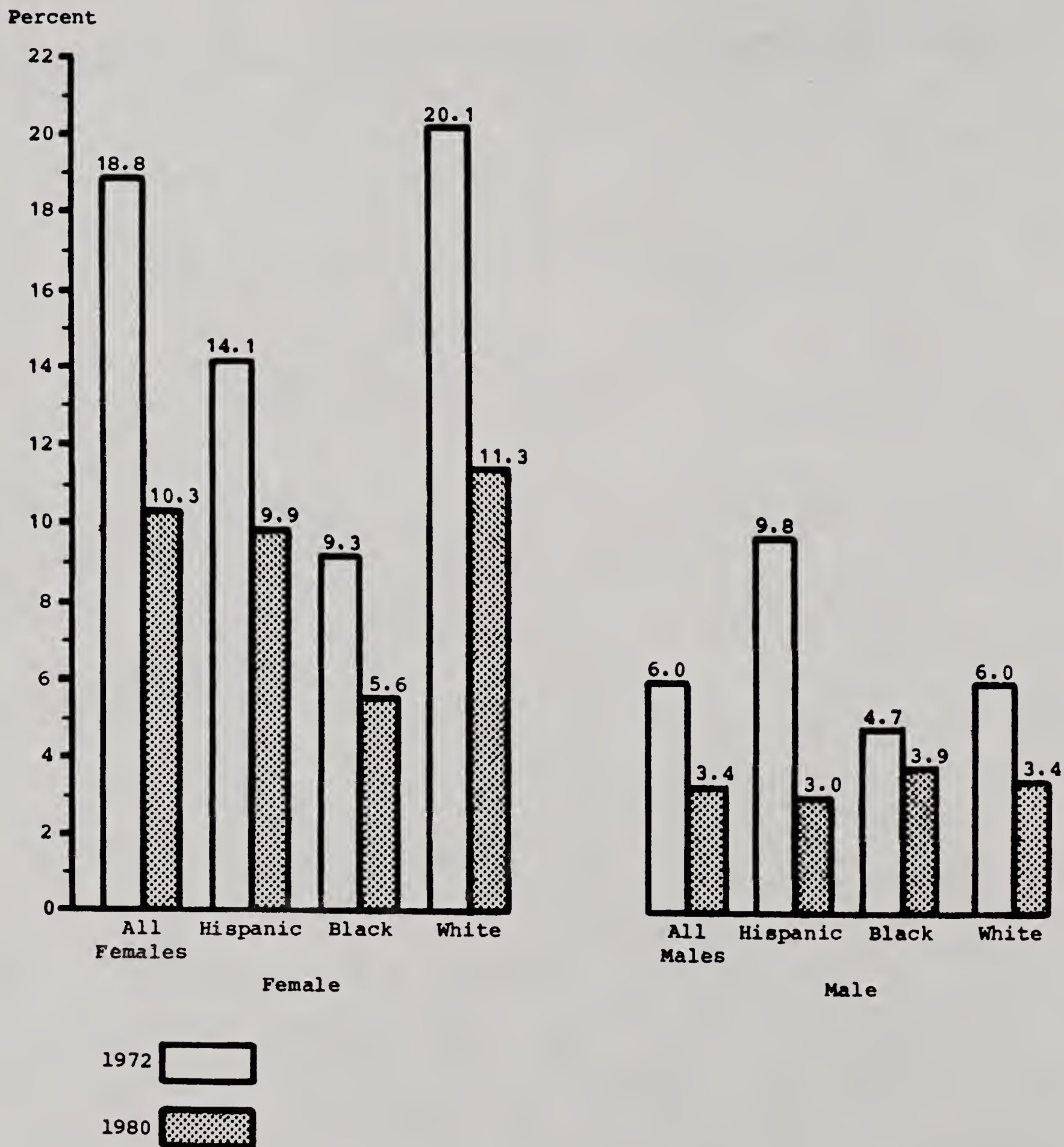
### Decline in Proportion of College Aspirants Planning to Major in Education

Percentage distributions of college aspirants who planned to major in education are shown by sex and race in table 1 and figure 1. Among 1980 seniors who planned to go to college, only about 3 percent of the males and 10 percent of the females planned to major in education. These percentages are

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<sup>1</sup>There were 7,969 seniors in NLS-72 who planned to go to college, of whom 959 planned to major in education. In HS&B, 11,259 planned to go to college, and 767 of them planned to major in education.

Figure 1 --Percentage of college aspirants who planned to major in education by sex and race/ethnicity: 1972 and 1980.





substantially lower than those for 1972 college aspirants--about 3 percentage points lower for males and 9 percentage points lower for females.<sup>2</sup> The decline was persistent across ethnic groups, e.g., white females from 20 to 11 percent; black females from 9 to 6 percent; and Hispanic females from 14 to 10 percent. (In terms of total counts, there were about 85,000 students in 1980, as compared to 150,000 in 1972, who planned to major in education.)

#### White Females Constitute the Majority of Prospective Education Majors

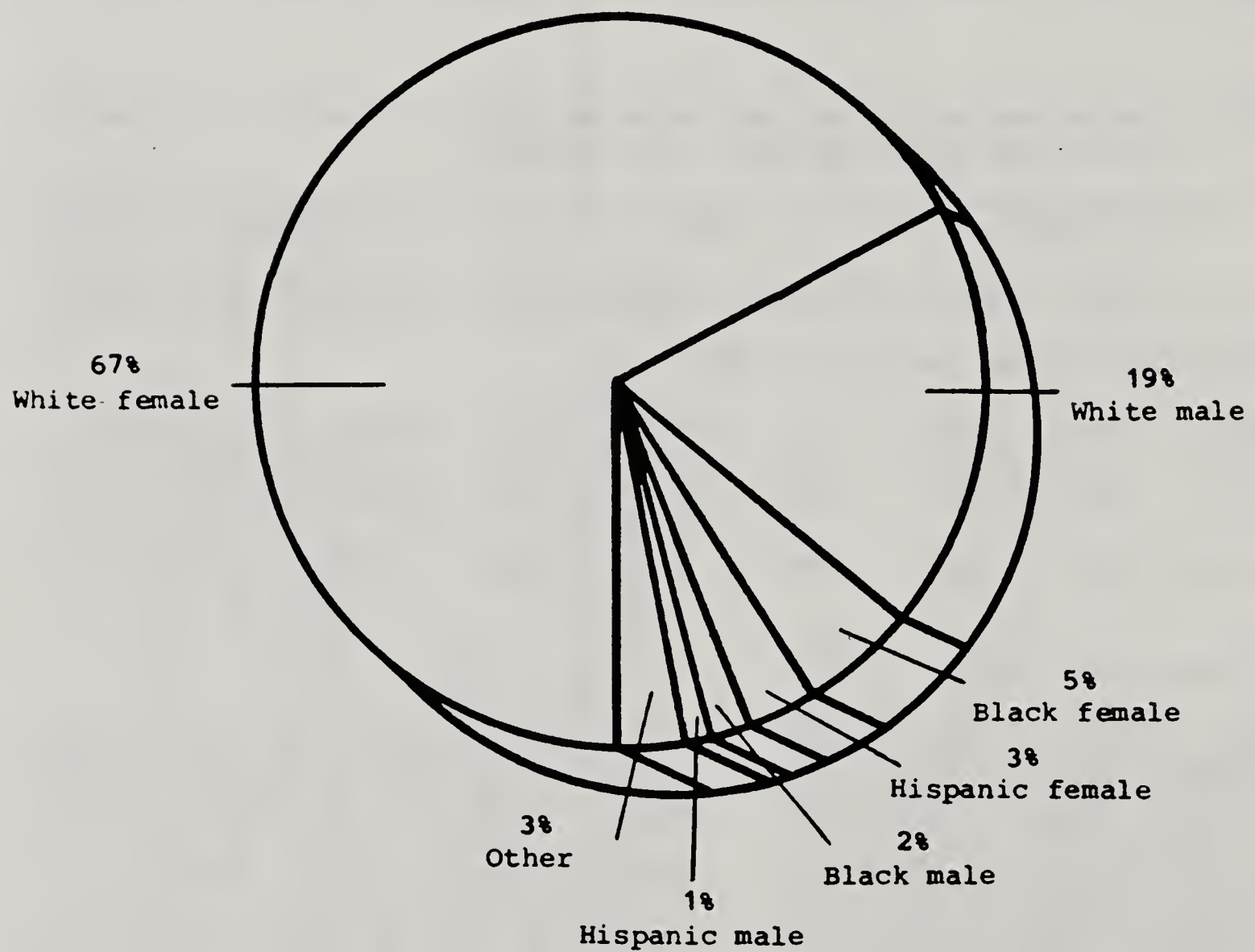
In both 1972 and 1980, about three times as many females as males planned to major in education (see table 1). Of those students who planned to major in education, white females constituted the majority. As illustrated in figure 2, they accounted for approximately 67 percent of all students who planned in 1980 to major in education. White males were second (19 percent), followed by black females (5 percent), Hispanic females (3 percent), and others.

Table 1--Percentage of college aspirants who planned to major in education, by sex and race/ethnicity: 1972 and 1980

Field	Total		Male			Female		
	Male	Female	Hispanic	Black	White	Hispanic	Black	White
High School and Beyond (seniors of 1980)								
Total. .	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education. .	3.4	10.3	3.0	3.9	3.4	9.9	5.6	11.0
Other. . .	96.6	89.7	97.0	96.1	96.6	90.1	94.4	89.0
Sample size	5,367	5,892	506	608	4,253	658	905	4,329
NLS-72 (seniors of 1972)								
Total. .	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education. .	6.0	18.8	9.8	4.7	6.0	14.1	9.3	20.1
Other. . .	94.0	81.2	90.2	95.3	94.0	85.9	90.7	79.9
Sample size	4,021	3,948	113	190	3,718	112	294	3,542

<sup>2</sup>The standard error of the difference between two percentages (d) can be approximated by taking the square root of the sum of the squares of the standard errors for p<sub>1</sub> and p<sub>2</sub>. That is,  $s.e.(d) = [s.e.(p_1)^2 + s.e.(p_2)^2]^{1/2}$ , where  $s.e.(p) = D [p(100-p)/n]^{1/2}$ , n is the sample size, and D is a correction factor estimated to be 1.38. The above approximation generally is conservative.

Figure 2--Distribution of college aspirants who planned to major in education, by sex and race/ethnicity: 1980





## Prospective Education Majors Have Lower Cognitive Achievement

Those 1980 college aspirants who planned to major in education had lower scores than other college aspirants had on reading, vocabulary, and mathematics tests (see table 2). The difference in test scores (with a mean of 50 and a standard deviation of 10) was more pronounced for males (1/3 standard deviation lower) than for females (1/5 standard deviation lower).<sup>3</sup> Seniors planning to major in education also had a lower grade-point average and had taken fewer courses in science and mathematics than those students majoring in other fields. These differences in academic qualifications were even more pronounced among males than among females.

### Differences between Education and Other Majors in 1972 and in 1980

Table 3 shows means and standard deviations of reading and vocabulary test scores for 1972 and 1980 college aspirants by sex and intended major. (Mathematics scores were not used in this analysis because the tests used in 1972 and in 1980 were not comparable.) Among female students, the differences in academic qualifications between those planning to major in education and those planning to major in other fields appear to be widening. Using vocabulary and reading test formula scores (i.e., the number of correct answers adjusted for guessing),<sup>4</sup> it was found that both groups of female students experienced test-score declines between 1972 and 1980, but those who planned to major in education had a somewhat steeper decline (see table 3 and figure 3.). In 1972 the differences were .4 for the vocabulary test and .5 for the reading test, but in 1980 the differences had increased to .7 and .8, respectively. (The maximum possible score for the vocabulary test is 15 and for the reading test, 20). When academic qualifications are measured jointly by the above vocabulary and reading test scores, the difference between prospective education majors and others is significantly greater (at the .05 level) in 1980 than in 1972.<sup>5</sup>

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<sup>3</sup>The standard error for the difference between two means ( $d = \bar{X}_1 - \bar{X}_2$ ) can be conservatively approximated as follows:

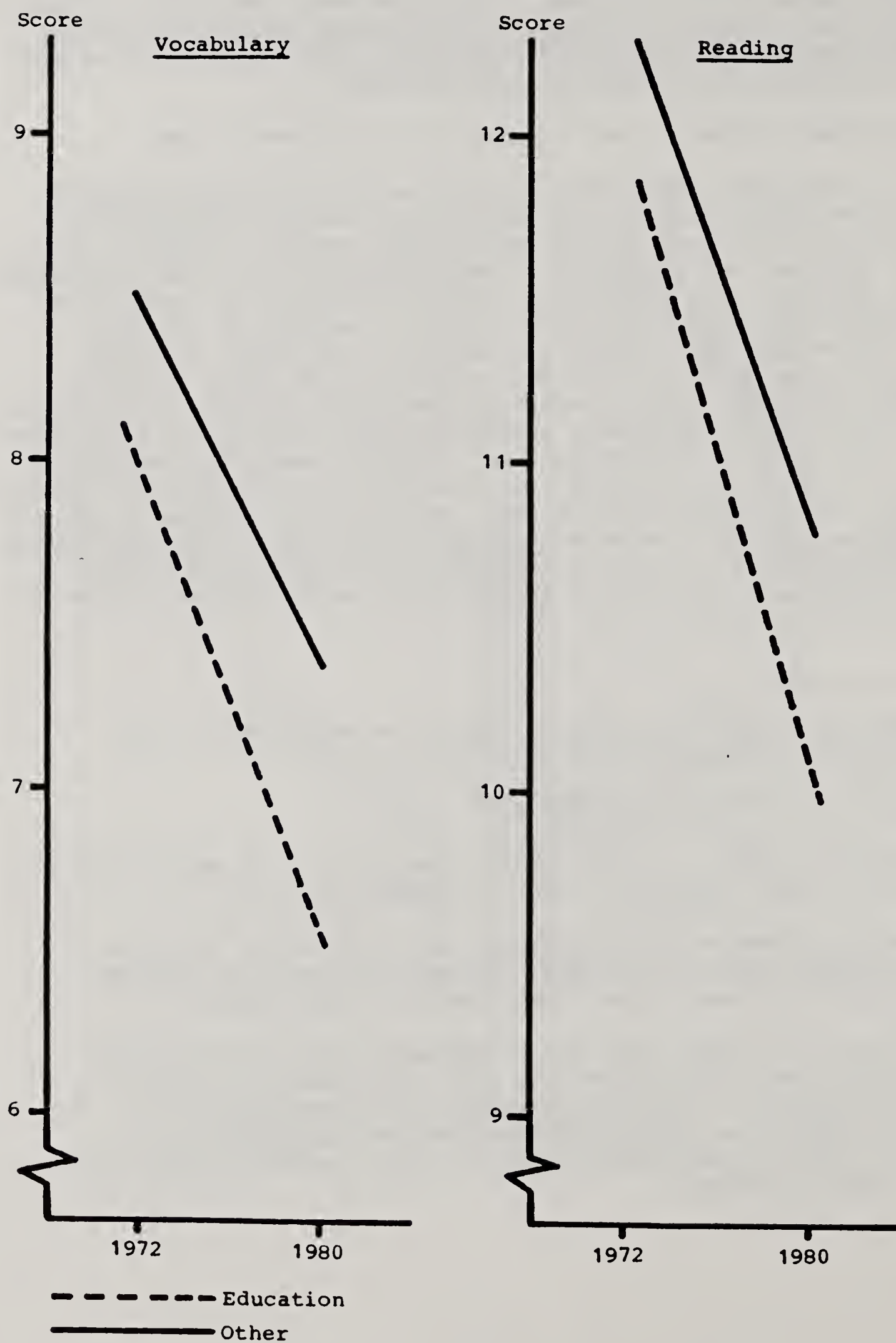
$$s.e.(d) = [s.e.(\bar{X}_1)^2 + s.e.(\bar{X}_2)^2]^{1/2}$$

where  $s.e.(\bar{X}) = D \frac{s}{\sqrt{n}}$ ,  $s$  is the standard deviation,  $n$  is sample size, and  $D$  is a design effect correction factor estimated to be 1.38.

<sup>4</sup>Formula scores instead of standard scores were used in this analysis in order to determine changes over time. Standard scores cannot measure changes because they were derived independently in each survey.

<sup>5</sup>Students were first cross-classified by planned major field (education vs. other) and year (1972 vs. 1980) to form a 2x2 factorial design. A multivariate analysis of variance of reading and vocabulary was then performed. Results show that the interaction term is significant (g.c.r.  $\theta = .001$ ,  $s=1$ ,  $m=0$ ,  $n=3164$ , and  $p < .05$ ). Further details can be obtained from the authors.

Figure 3--Changes in vocabulary and reading test scores of female college aspirants, by intended major: 1972 and 1980



Among male students, the above trend was not observed; the differences in vocabulary and reading tests scores between prospective education majors and others were not widening. (Indeed, they were narrowing on the vocabulary test.) However, since male students constituted less than 25 percent of the total prospective education majors (see figure 2), they did not counterbalance the overall decline in academic qualifications of female students who planned to major in education.

#### For More Information

This analysis was performed by Samuel S. Peng, Jeffrey A. Owings, and William B. Fетters. Additional information about the data bases used is available from Samuel S. Peng, National Center for Education Statistics, 400 Maryland Avenue SW. (Mail stop 1001), Washington, D.C. 20202, telephone (301) 436-6688.

Inquiries about the availability of HS&B and NLS-72 computer tapes should be directed to the Statistical Information Office, National Center for Education Statistics, 400 Maryland Avenue SW. (Mail stop 1001), Washington, D. C. 20202, telephone (301) 436-7900. A description of the Center's statistical program and a catalog of NCES publications may also be obtained from the Statistical Information Office.



Table 2--Mean academic preparation measures of college aspirants, by sex and intended major: 1980

Academic preparation measure	Total		Male		Female	
	Education major	Other major	Education major	Other major	Education major	Other major
Test scores <sup>1</sup>						
Reading. . . . .	52.31 (9.21) <sup>2</sup>	54.77 (9.15)	51.86 (9.52)	55.13 (9.06)	52.45 (9.11)	54.42 (9.23)
Vocabulary . . . .	51.69 (8.31)	54.55 (9.27)	51.75 (7.98)	55.20 (9.16)	51.70 (8.41)	53.91 (9.33)
Mathematics. . . .	51.54 (8.43)	55.02 (7.66)	51.79 (8.48)	56.58 (8.28)	51.46 (7.40)	53.51 (8.31)
Grade-point average <sup>3</sup> . . . .	6.25 (1.22)	6.36 (1.28)	5.79 (1.25)	6.18 (1.30)	6.39 (1.18)	6.53 (1.23)
Number of math courses . . . . .	2.53 (1.23)	3.12 (1.33)	2.50 (1.27)	3.30 (1.31)	2.53 (1.21)	2.95 (1.32)
Number of science courses . . . . .	.62 (.67)	.94 (.80)	.74 (.72)	1.09 (.83)	.59 (.65)	.78 (.75)
Proportion in academic program . . . . .	.55 (.50)	.66 (.47)	.47 (.50)	.68 (.47)	.58 (.49)	.64 (.48)
Sample size . . . . .	767	10,492	172	5,195	595	5,297

<sup>1</sup>Standard scores with population mean of 50 and standard deviation of 10.

<sup>2</sup>Numbers in parentheses are standard deviations.

<sup>3</sup>Student self-reported grades ranging from "mostly A" (coded 9) to "mostly below D" (coded 1).



Table 3--Mean vocabulary and reading test scores of college aspirants, by sex and intended major: 1972 and 1980<sup>1</sup>

		Male		Female	
Test	Intended major	1972 seniors (NLS-72)	1980 seniors (HS&B)	1972 seniors (NLS-72)	1980 seniors (HS&B)
Reading:					
	Education. .	10.59 <sup>2</sup> (4.20) <sup>3</sup>	9.69 (4.94)	11.88 (4.01)	9.99 (4.72)
	Other. . . .	12.03 (4.32)	11.16 (4.81)	12.35 (4.54)	10.84 (4.85)
Vocabulary:					
	Education. .	6.50 (3.85)	6.20 (3.36)	8.05 (3.35)	6.59 (3.60)
	Other. . . .	8.19 (3.91)	7.43 (3.88)	8.49 (4.01)	7.31 (4.01)
Sample size:					
	Education	267	172	692	595
	Other . . .	3,754	5,195	3,256	5,297

<sup>1</sup>Mathematics scores were not used in this analysis because the tests used in 1972 and in 1980 were not comparable.

<sup>2</sup>Presented in this table are mean formula scores (i.e., the number of correct answers adjusted for guessing).

<sup>3</sup>Numbers in parentheses are standard deviations.

